Answer on Question #64410 – Math – Calculus

Question

Write a polynomial function of minimum degree with real coefficients whose zeros include those listed. Write the polynomial in standard form.

4, -8, and 2 + 5i

Solution

If number a is a zero of the given polynomial, then the $(x-a)$ is a factor of this polynomial.

If the complex number $(2+5i)$ is a zero of the polynomial with real coefficients, then its conjugate $(2-5i)$ also must be a zero of the polynomial.

Therefore, we get

$$(x-4)(x+8)\big(x-(2+5i)\big)\big(x-(2-5i)\big)=$$

$$=(x^2+4x-32)\big(x^2-(2-5i)x-(2+5i)x+(2+5i)(2-5i)\big)=$$

$$=(x^2+4x-32)(x^2-4x+29)=$$

$$=x^4-4x^3+29x^2+4x^3-16x^2+116x-32x^2+128x-928=$$

$$=x^4-19x^2+244x-928.$$

Answer: $x^4-19x^2+244x-928.$